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PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference B 14239.3 JL	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/FR2003/050077	International filing date (day/month/year) 03 octobre 2003 (03.10.2003)	Priority date (day/month/year) 07 octobre 2002 (07.10.2002)
International Patent Classification (IPC) or national classification and IPC H01L 21/762		
Applicant COMMISSARIAT A L'ENERGIE ATOMIQUE		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of                      sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 29 avril 2004 (29.04.2004)	Date of completion of this report 20 December 2004 (20.12.2004)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FR2003/050077

## I. Basis of the report

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

- ☐ the international application as originally filed.
- ☒ the description, pages 1-30, as originally filed,  
 pages \_\_\_\_\_, filed with the demand,  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_,  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- ☒ the claims, Nos. 1-16, as originally filed,  
 Nos. \_\_\_\_\_, as amended under Article 19,  
 Nos. \_\_\_\_\_, filed with the demand,  
 Nos. \_\_\_\_\_, filed with the letter of \_\_\_\_\_,  
 Nos. \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- ☒ the drawings, sheets/fig 1/3-3/3, as originally filed,  
 sheets/fig \_\_\_\_\_, filed with the demand,  
 sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_,  
 sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

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## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	1-16	YES
	Claims	none	NO
Inventive step (IS)	Claims	1-16	YES
	Claims	none	NO
Industrial applicability (IA)	Claims	1-16	YES
	Claims	none	NO

## 2. Citations and explanations

## 1. Reference is made to the following documents:

D1: FR-A-2 809 867 (COMMISSARIAT ENERGIE ATOMIQUE)  
7 December 2001 (2001-12-07);

D2: US-A-5 877 070 (TONG Q-Y ET AL) 2 March 1999  
(1999-03-02).

## 2. The application does not fulfil the requirements set forth in PCT Article 6 because claims 1, 9 and 16 are not clear.

2.1 Claim 1 is not clear in so far as it defines a "method for producing a **detachable** semiconductor substrate". The reader is unable to determine which technical features are implied by the term "detachable", especially since said term refers to subsequent production steps that are not defined.

Moreover, claim 1 defines a step of "heat-treating said substrate [...] until the appearance of local deformation [...] in the form of blisters, but without generating thin-film exfoliation during said step or **throughout the rest of the method**". Said claim

attempts to define the subject matter for which protection is sought in terms of the result to be achieved. Said result is, in turn, defined in relation to subsequent production steps that are not specified. This definition does not enable a person skilled in the art to determine which technical features are necessary for carrying out said heat treatment.

2.2 The objections raised with respect to claim 1 also apply to claim 9.

2.3 Finally, claim 16 is not clear because it involves "providing a substrate **which has already been detached**". The substrate used cannot be defined by means of a reference to a preceding method, which has not been defined clearly either.

It is not possible for the reader to determine to which step of the method or to which surface the "conditioning" as defined in the claim refers.

3. **Provided that claims 1 and 9 are clarified**, they would appear to be novel and inventive.

3.1 Document D1, which is considered to be the prior art closest to the subject matter of claim 1, describes (page 18; figures 1a and 1b) a method for producing a semiconductor substrate, including the following steps of:

- inserting gaseous species into the substrate under conditions that enable the formation of a film weakened by the presence therein of micro-cavities and/or micro-bubbles, whereby a thin

film of semiconductor material is defined between the weakened film and a surface of said substrate;

- heat treating said substrate in order to increase the weakness of said weakened film; and
- epitaxying semiconductor material onto said substrate surface in order to provide at least one epitaxy film on said thin film.

It follows that the subject matter of claim 1 differs from this known method in that the heat treatment is carried out until local deformation in the form of blisters appears on said substrate surface, but without generating exfoliation.

As a result, the subject matter of claim 1 would appear to be novel (PCT Article 33(2)).

Even though D2 discloses a way in which such blisters can be produced (cf. column 6, lines 1-13), said blisters are not considered to be desirable and the use thereof in a similar method is not mentioned anywhere in the prior art.

It follows that claim 1 appears to involve an inventive step (PCT Article 33(3)) and claims 2-8, which are dependent thereon, therefore also appear to fulfil, as such, the PCT requirements of novelty and inventive step.

- 3.2 D1 describes a method for producing an element made of a semiconductor material, characterised in that it includes the following steps of:

- providing a semiconductor substrate including a substrate that has a weakened film defining a thin film, and
- detaching said semiconductor substrate by separating same at said weakened film.

As a result, the subject matter of claim 9 differs from this known method in that the substrate that is provided is blistered.

It follows that the subject matter of claim 9 appears to be novel (PCT Article 33(2)).

The use of a blistered substrate in a similar method is not mentioned anywhere in the prior art.

The subject matter of claim 9, therefore, appears to involve an inventive step (PCT Article 33(3)) and claims 10-16, which are dependent thereon, consequently also appear to fulfil, as such, the PCT requirements of novelty and inventive step.

4. Claims 1-16 fulfil the requirements of PCT Article 33(4).